Labtec

User Manual
Labmatic 1500

No	Contents	Page
1	Foreword	2
2	Description of the Equipment	3 - 4
3	Accessories	5
4	Specifications	6
5	Starting Up	7
6	Safety	8
7	Care and Maintenance	9

Valid for the types:: LM 1500 plus1, LM 1500 plus2

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1 Foreword

1. 1 Important Notes

Before starting up the equipment the instructions for use should be read carefully, and they should be observed in all matters.
The include instructions for operating and caring for a Labmatic 1500 test stand from the serial number noted onward. It is essential to correct operation of the equipment that it is operated and used exclusively as described in these instructions. Labtec accepts no responsibility for damages to persons or property or for any late resultant squeal if the equipment has been used in a manner that deviates from the operating instructions.
The same applies to incorrect care, maintenance and repairs to the equipment.
Labtec recognizes no claims under the guarantee if the equipment has been operated, maintained or repaired by persons who have not received proper instruction and if original replacement parts have not been used in repair and maintenance work. The same applies if sealed parts have been opened unless expressly permitted by Labtec.
Otherwise the sale and delivery conditions of Labtec GmbH apply, which are in no wise extended by these notes.

1.2 Use as Stipulated

The test stand is designed to test breathing apparatus as per EN 137, full face masks as per EN 136 and leak tight chemical protection suits as per EN 943-1. Contact Labtec for information on testing other breathing equipment or chemical protection suits.

Only respiratory air as per EN 12021 (DIN 3188) is approved for operation of the equipment.

1.3 Safety Hints

At the initial start-up and during work with the equipment and maintenance on it the national safety and accident prevention regulations in force are to be observed.

1.4 Transport and Setting Up

The Labmatic 1500 are fixed-position plant. It should therefore only be transported in exceptional circumstances. The equipment is set up by a Labtec customer service team or by a specialist appointed by Labtec.

1.5 Electrical Supply

a) Before the initial start up be absolutely sure that voltage and frequency are as prescribed.

b) The equipment must not be plugged in to a n y power socket that does not have the specified voltage

1.6 Starting up

Important !

Before the test stand is turned on care must be taken to make sure that there is no pressure on the measuring sensors. That is to say that the high-pressure main valve must not on any account be open, a compressed air respirator must not be attached and there must not be a face mask with activated respiratory seal mounted on the test head. Unless all these conditions are met the test stand will not be correctly calibrated and the values shown in the displays will be wrong. Once the calibration process has been completed (the LCD displays must be on zero) the test procedures can be started.

1.7 Operation of the test stand

Once the test stand has been started up by the Labtec staff or appointee it can be operated by the user and used as working equipment. It is essential for the user to have basic knowledge of use of a PC with Windows 2000 or XP.

1.8 PC specifications

For fully automatic (computer-controlled) operation an IBM-compatible PC with a main memory capacity of at least 100 MB or greater, min. clock frequency of 1000 Hz or more and 1 GB or greater of free memory on the hard disk must be available. A suitable printer that takes DIN A4 paper is needed if printouts of protocols are to be made. In addition, memory capacity is also needed for recording the equipment test data, how much depending on the number and complexity of tests carried out and the length of time data are kept on the hard disk.

2 Description of the Equipment

Test Stand Housing (A)
The test stand's ergonomic design means that it can be operated even for long periods without fatigue. It is operated by way of electric buttons or switches and by way of the PC keyboard and mouse when fully automatic operation is in force. The operating board is arranged at an angle to allow good visibility at all times.

Multi-function Test head (C)
The test head is a fixed-position head that can be inflated by means of an electrical pump, so that full face masks can be fitted with a leak proof seal regardless of make. One measuring point is integrated in the mouth opening of the head and one in the forehead; each of these measures the internal pressure inside the mask or the demand valve.

Artificial Vario-Lung
There is an artificial Vario-lung in the Labtronic 1500, which is driven by a stepping motor and is infinitely variable in lift and respiratory frequency. The desired ventilation can be set in the software with the lift frequency infinitely variable between 10 and 50 / min and volume, between 1.0 and 3.0 l.

Vacuum Pump
The integrated vacuum pump is used to generate the airflows needed and to inflate or deflate the test head. The desired air output (volume) can be entered in the software at levels varying from 2 to 12 l/min.

Processor
The integrated processor takes over the control and the signal transformation.

Air Supply / Connection of the Equipment
The air supply and power connection vary according to the type of test stand concerned.

Labtronic 1500 plus1
This version is designed for einen fixed connection to a central 300-bar air supply. A 6-mm stuffing box **(D)** is provided for this purpose on the left side wall of the test stand. A connecting piece for 300-bar appliances **(F)** is fitted to the front of the test stand.

Labtronic 1500 plus2 an Labtronic 2000
This model has an additional connecting piece for 200-bar appliances **(E)**, a transformer lever **(K)** for switching between 200 > - < 300 bar, and an integrated pressure reducer for 300 to 200 bar.

Medium Pressure Connection (G, H)
On the front is a connection nipple for medium-pressure connection of appliances **(G)** and a high-speed coupling for the demand valve connection **(H)**.

Test Connection for Chemical Connection Suit

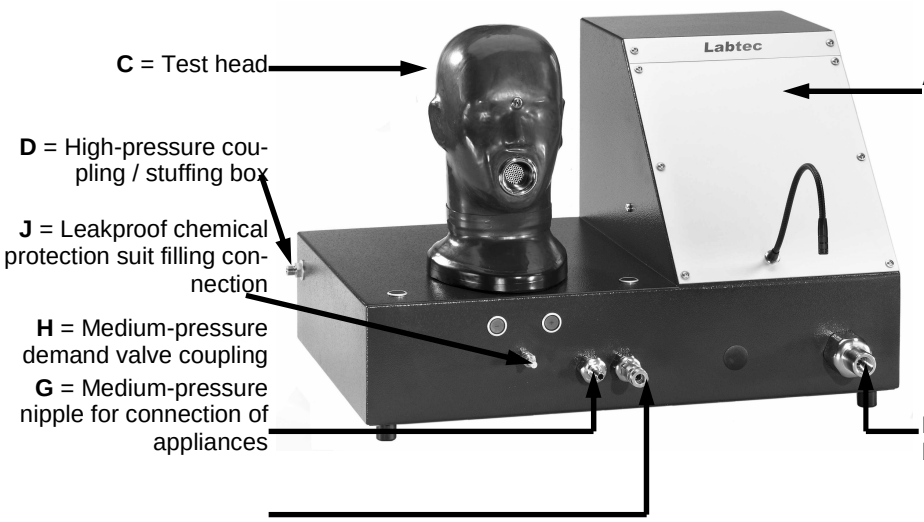
Test Connection (J)
High-speed coupling for filling leak proof chemical protection suits.

Power Control (L)
As a special model for testing the closing pressure of a resistance alarm an additional power control valve is mounted on the right-hand side, which allows very slow increase of the inlet pressure from 0 to 300 bar.

Electrical Power Supply (M)
On the right-hand side of the housing there is a power socket for machine connection with an integrated ON/ OFF switch containing a 5-A reserve safety fuse.

Serial Interface (N)
Also on the right-hand side of the housing there is a serial interface point for data transmission to a PC.

2 Description of the Labmatic 1500



C = Test head

A = Test Stand Housing

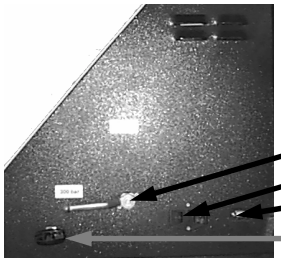
D = High-pressure coupling / stuffing box

J = Leakproof chemical protection suit filling connection

H = Medium-pressure demand valve coupling

G = Medium-pressure nipple for connection of appliances

F = Connection Piece 300 bar

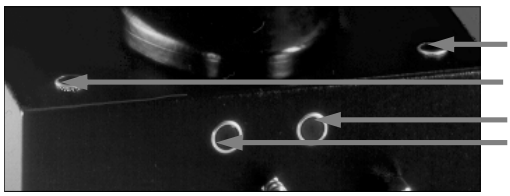


K = Transformer lever for switching between 200 and 300 bar

M = Electrical power supply with ON/OFF switch

N = Serial interface point

L = Power control valve for slow increase of inlet pressure



+ = Test head filling (T)

- = Test headempty (T)

S = Suit filling (T)

E = Suit Pressure down (T)

3 Accessories

Order-No	Description	Explanation
161 027	Dust cap RD 40	To seal breathing valve of NP full-face masks with RD 40×1/7" (EN 148-1)
161 028	Dust cap PE 45	To seal breathing valve of HP full-face masks with metric thread M 45×3 mm
161 032	Dust cap EAS	To seal breathing valve of HP full-face masks with universal plug-in connector DIN 58 600
161 046	Adapter RD 40	To accept NP demand valves with RD 40×1/7" (EN 148-1) in Labtest test head
161 048	Adapter PE 45	To accept HP demand valves with metric threads M 45×3 in Labtest test head
161 051	Adapter AUSV	To accept Auer HP demand valves with plug-in connectors in Labtest test head
161 052	Adapter DRSV	To accept Dräger and B&R HP demand valves with plug-in connectors in Labtest test head
161 059	Adapter SASV	To accept Sabre HP demand valves with plug-in connectors in Labtest test head
161 068	Adapter ISSV	To accept Interspiro / Spiromatic P HP demand valves with bayonet fittings in Labtest test head
161 069	Adapter EASV	To accept HP demand valves with universal plug-in connector DIN 58 600
808 605	Silicon spray	For treatment of test head
142 507	Test head ES	As replacement (ask your Labtec agent)
161 061	CPS test adapter type CGA 2000	For testing chemical protection suits (CPS) with an adapter set, depending on make
161 062	CPS adapter AU	For CPS with Auer excess pressure valves
161 063	CPS adapter DG	For CPS with Dräger excess pressure valves (large)
161 064	CPS adapter TG	For CPS with Trelleborg excess pressure valves
161 065	CPS adapter GK	For CPS with Dräger excess pressure valves (small)

161 027, 028, 032

161 046, 048,

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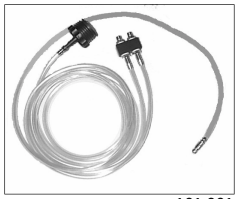
161 052

161 068

161 069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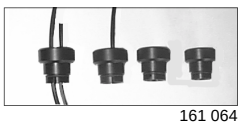
161 062 / 063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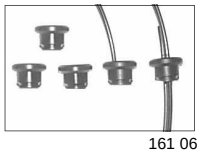
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4 Specifications

Part	Description	Unit	Item
Breathing Machine Engine	Voltage Wattage Current Protection class	V / Hz W A	220-230 / 50 100 0,7 - 0,8 IP 44
Transformer	Voltage in Voltage out Current consumption	V / Hz V / Hz A	220 – 230 / 50 24 DC E = 0,4, A= 2,5
Vacuum Pump	Voltage max. Current consumption max. Vacuum int.	V A mbar	24 DC 3 750
HPD-Magnetic Valve 1 x	Voltage Pressure max. Current consumption	V / Hz bar A	220 - 230 / 50 0...400 0,4
MP-Magnetic Valve 2x	Voltage Pressure Current	V / Hz bar W	220 - 230 / 50 0...16 13,5 x 2 = 27
LP-Magnetic Valve 9x	Voltage Pressure Current	V bar W	24 DC 0...30 10 x 9 = 90
LP-Magnetic Valve 1x	Voltage Pressure Current	V bar W	220 – 230 / 50 0...30 10 x 9 = 90
HP Sensor	Measuring range Signal Zero signal offset Linearity Hysteresis	bar mA FS FS FS	0...400 4...20 < ± 1 % < ± 0,5 % < ± 0,05 %
MP Sensor	Measuring range Signal Linearity	bar mA FS	0...25 4...20 < ± 0,5 %
Flow Sensor	Voltage Current	V mA	24 DC 4...20
Total Unit	max. Working Pressure	bar	330
	Power	V / Hz	220 / 60 V AC 24 V DC
	Central Fuse	A	5
	Total wattage	W	ca. 500
	Dimensions (W X D x H)	mm	1000 x 500 x 540

5 Starting up

Setting Up

The test stand must be set up on a horizontal firm surface. A table or workbench at desk height (ca. 72 ± cm) is advisable. It is essential that the base be free of any vibrations. Drawers, pigeon holes or similar are not recommended with the "plus" models, as when breathing apparatus is connected up these are no longer accessible.

To the left of the test stand on the workbench there must be enough space (approx. 1 m) for putting down masks and other test pieces. The PC and the screen, and also the printer and the mouse pad should be positioned to the right of the test stand.

Compressed Air Connection

The test stand is best operated when connected to a central compressed air supply by way of stock cylinders (types LM 1500 plus 1 and plus 2). On the right of the test stand there is a 6-mm stuffing box. A sintered filter with a non return valve must first be mounted on this. This belongs to the delivery. The central air supply is then connected with the high-pressure hose also supplied with the plant. For type LM 1500 the air is best supplied by way of a 6- or 6.8-l / 300-bar respiratory air cylinder.

To make execution of the high-pressure tests, an adequate high-pressure cushion of at least 300 bar must be guaranteed.

Electrical connection

Simply use the connecting line supplied with the test stand to connect it up to a 220 V / 50 Hz power source. The test stand appliance power socket has a central 5 A safety fuse, which protects the test stand against extreme power fluctuations.

In any case we recommend a separate electric circuit for the test stand and PC.

Turning on the Test Stand

The test stand is activated by pressing the electrical main switch (M). Once the test stand is switched on the sensors are calibrated separately. The tests cannot be started until the calibration process is complete.

If the test stand is separated from the PC (switched off), in some circumstances the Labtronic NT system program may need to be rebooted so that data synchronization can be done.

Installation of the Labtronic NT Software

The test stand cannot be operated by way of a PC until the Labtronic NT program supplied with it has been installed. As a rule it is installed on delivery by the Labtec customer service personnel. If you are installing it yourself, insert the CD in the CD drive and start the set up routine by Program ® Execute. Then follow the installation instructions.

After switching on the test stand and calling up the Labtronic NT program it is then possible to work with the test stand.

"See separate operating instructions on LabtronicNT"

Caution !

Particularities of remote control operation

The artificial lung has 2 expiratory (overpressure) valves that open automatically. During fully automatic operation these are automatically activated when the lung is switched on. This means that air inspired through the demand valve connected to the test head can escape.

If the lung is operated manually, an opportunity for breathing out between test head and demand valve must be created. This can be done by using an appropriate full face mask or the additional adapter supplied routinely (adapter AVN for normal-pressure demand valves, adapter AVP for over-pressure demand valves, with M 45 ×3 connecting thread).

6 Safety

Electrical Main Fuse
The machine power socket on the right-hand side of the test stand has an integrated 5 A safety fuse. This protects the test stand against excessive power surges from external sources. A spare fuse can be found in the socket.

Intrinsic Protection
The test stand incorporates exhaustive intrinsic protection. If, for example, the pressure in one pressure range rises above the defined limiting value the system switches itself off and there is also an acoustic alarm signal.

Self-Activating Resetting
In the case of a disturbance the system, or the components of the system that are affected, is/ are returned to the normal settings with no intervention from the operator. Inadmissible over- or under pressure, for example, is automatically corrected. Following recovery of the normal condition the alarm signals stop.

Overload Protection for the Lung
The artificial lung has integrated overload protection. If the pressure exceeds the prescribed limit values (--50...+50 mbar) the lung is switched off automatically. It cannot be switched on again until the pressure level is back between the prescribed limit values.

Testing of Automatic Overpressure Demand Valves
As the low-pressure range is only up to 50 mbar, the maximum test value for the connection pressure is also only --50 mbar. For a few demand valves the connection pressure of the automatic overpressure can be over 50 mbar. For a tightness test or a test of the respiratory resistances to be possible the overpressure of the demand valve must have been switched on beforehand.

Essential caution
- First switch on the (electrical power supply to the) test stand and then call up the PC Program Labtronic NT.
- Never test polluted demand valves or masks on the test head. This would involve the danger of introducing dust particles into the measuring system, which can have a deleterious effect on the function of the magnetic valves.
- **Before switching off the electrical power supply to the test stand, it is essential to remove the breathing equipment and relieve the pressure on the test stand. Safety systems function only when voltage is applied!**

Important for safety!
Never open the housing of the test station without disconnecting the apparatus from the electricity supply by pulling out the mains plug!

7 Care and Maintenance

The test stand does not need any special care. It should, however, be protected from external harmful influences (water, damp in the form of steam, dust).

The test head needs no special maintenance, but should be regularly cared for (end of each working day; see below).
The test head skin is made of natural rubber (Latex). Latex is ozone sensitive, and the test head therefore must not be placed in full sunlight. In the case of stand-still for any length of time it is best to cover it with a cloth or something similar. If the test head becomes dirty it should be washed with soapy water.

Do not use any solvents on it !
The skin is certainly very robust and relatively thick, but can be damaged by sharp objects, which would mean the test head was no longer functional. Labtec does repairs or applies new skins in the works.

Essential caution !
There are some disinfectant agents that can damage the latex skin of the test head if full face masks are not rinsed 100% after disinfections and disinfectant residues therefore get onto the latex skin of the test head. For this reason it is important to use only such disinfectant agents as are **free of phosphates, aldehydes and phenoles**. No agents containing oil, grease or solvents must be used for the care of the head. These all damage the skin of the head.

The life time of the test head is not a part of the guarantee